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ABSTRACT

The preparation and use of an objective strength analysis report (OSAR) from the Iowa Test of Basic Skills (ITBS) are described. The OSAR was designed to answer two needs: (1) a format which allows the school to easily answer the question "which reading objectives need more emphasis and/or better materials or techniques in order to raise its reading scores"; and (2) an easy comparison between grades and through time in order to detect consistent strengths and weaknesses. A sample report from a real school, with a fictional name, is appended. An examination of the sample report shows that the ITBS divides the Reading Comprehension subtest into three conceptual subskills and 16 objectives. In this case, the OSAR shows seven strand scores for each of grades 3-8. These strands were chosen such that an average of six to 10 items are used to assess a conceptual area having some continuity across grades. Districts obtain the ITBS group item performance reports on a building-by-building basis. Copies are made for each basic skills teacher for the grades being assessed. (RL)

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AN ANALYSIS OF OBJECTIVE STRENGTH PATTERNS FROM THE IOWA TEST OF BASIC SKILLS

Developed for the AERA Symposium:
Techniques and Limitations in Interpreting
Subskill Scores on Achievement Tests

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ABSTRACT

The objective strength analysis process encompasses a five-step plan:

1. Districts obtain the ITBS group item performance reports for each building.
2. Building data are compared with state item norm averages using mean percentage differences and arcsine transformation differences.
3. Using district vocabulary arcsine transformation differences as a criterion variable, comparisons are made with all other subtest and subskill transformation differences.
4. Reports are prepared and presented to building faculty members during a workshop. The session helps members locate objectives which are "off target," when compared with projections based on student vocabulary scores.
5. Results are used, as appropriate, in instructional planning. The results of three years of report usage indicate that substantial achievement gains are realized the first year by all schools, and the second year by most schools. The process is now used by one-third of Iowa's school districts.

AN ANALYSIS OF OBJECTIVE STRENGTH PATTERNS

FROM THE IOWA TEST OF BASIC SKILLS

Intent of this paper. The Northern Trails Area Education Agency has developed an objective strength analysis report which is widely used in Iowa, and appears to allow building staff to easily modify local curriculum in such a way that ITBS scores improve. This paper describes the preparation and use of that report.

Why was the Objective Strength Analysis Report Developed?

Three types of reports are now available to schools who use the Iowa Tests of Basic Skills. A report of the school rank and average grade equivalent score by subtests indicates broad areas of weakness or strength. The group item analysis report will indicate on which items the class averages are substantially below the state or national average. The individual item report will show that specific students missed specific items on the various subtests.

None of these reports are in a format which allows the school to easily answer the question "which reading objectives need more emphasis and/or better materials or techniques if we are to raise our reading scores." Furthermore, none of the three reports allow easy comparisons between grades and through time in order to detect consistent strengths and weaknesses.

The objective strength analysis report was designed to answer these needs. Where possible, items are grouped into conceptual "chunks" of 5 - 8 items each. The items are reported in a format which allows easy comparison of group score means for building and state averages across grades, and for an easy comparison of expected score differences (based on vocabulary score differences) and achieved differences. In addition, multiyear comparisons can be easily placed in the report so that information from two consecutive years and two different forms can be examined to detect consistent strength and weakness patterns within the test.

What is an Oojective Strength Analysis Report?

A sample report from a real school, with a fictional name is appended to this paper. This report allows district faculty to answer the following questions:

1) In which areas of the Iowa Test of Basic Skills (ITBS) do our students perform above, at, and below levels predicted using their group vocabulary score as a standard?

2) On which subtests and objectives do students perform above, at, and below expectations for two or more years?

3) Which weak objectives are assessed using enough items to demonstrate a serious mismatch between the district curriculum being learned and assessed?

4) What suggestions are available to improve performance in areas of identified weakness?

Why are Vocabulary scores used to estimate student achievement potential?

Most of our schools do not administer any standard aptitude tests in conjunction with their ITBS testing. Therefore, any estimate of group potential for achievement on the ITBS test must be made using data that is an integral part of the test. ITBS Vocabulary scores correlate well with abstract reasoning assessment scores, general I.Q. scores, and all other subtest scores on the ITBS. In addition, group vocabulary score means are one of the most stable scores on the ITBS. For these reasons, the Vocabulary scores were chosen as the best available data to use in estimating how a group of students "should" do on reading, math, capitalization and other subtests of the ITBS. The prediction is far from perfect, but its performance appears to be adequate.

How are the data grouped in an objective strength analysis report?

The Iowa Tests of Basic Skills provides a a group item analysis of each test set. These items are grouped into over 100 objectives and into 58 subskills which include one or more objectives. The number of items per objective and subskill varies from form to form and from grade to grade. This author placed all items into 54 strands of objectives and/or subskills. These strands were grouped so that an average of 5 to 6 items per grade would assess an identifiable strand of curriculum in the schools in our area.

Specifically, if pages 6 and 8 of the appended report are examined, it can be seen that ITBS divided the Reading subtest into three conceptual subskills (F, I, & G), and 16 objectives (F1 through G8). In this case, the objective strength report on pages 5 and 7 reports seven strand scores for each grade. These strands were chosen such that an average of 6 to 10 items would be used to assess a conceptual area which had some continuity across grades.

How is the report data calculated?

1) Districts obtain the ITBS group item performance reports on a building-by-building basis.

2) Grade item percent correct and state item percent correct are transformed into their arcsine radian equivalents. This transformation stretches the tails of the distribution, linearizes the score values, and increases the variance.

3) The mean grade and state item percent correct scores are calculated for each ITBS subtest and objective. These means, and their difference score are placed in the report "boxes" as explained at the base of each report page in the appended report.

4) Average transformation score differences in radians between the grade and state scores are computed.

The average vocabulary transformation difference in radians is computed for each grade, and this difference is compared with every other subtest and objective difference in the report. If the difference between the expected and observed score differences is greater than 0.1 radians, a "+" or "-" is placed in the center of the report "box" depending on the direction of the difference. If the difference is larger than 0.2 radians, "++" or "--" is entered.

How is the report used?

The report is prepared on a building by building basis for a district. Copies are made for each basic skills teacher for the grades being assessed. If fall data are used, second grade teachers review the third grade reports and so on up through the grades.

Staff are handed the reports during a 45-minute workshop which has the following components:

1) The reports are distributed. The contents of the data "boxes" are explained, and the concept of using vocabulary scores as predictors of student achievement is taught.

2) Each teacher quickly reviews the data for his/her grade level and notes areas of particular strength and weakness.

3) Areas of strength are noted in relation to any upcoming curriculum change efforts in the district.

4) Areas of weakness are re-examined to see whether four or more items were assessing the objective and to note whether the weakness extended across grade lines.

5) Each staff member chooses two to three objectives which are consistently eliciting poor performance and focuses on the "facing" pages in the report. The number and distribution of items within the strands is noted, and the ITBS suggestions for improvement are read.

6) Teams are assigned to determine what can be done to improve scores, and simple reports of plans are submitted to the building administrator.

What data are available to evaluate the process?

The first report of this type was used with four school districts with 1000 total students during the 1978-79 school year. An additional set of six districts with 3000 students was added during the 1979-80 school year. To date this year, over 100 districts have utilized the report.

Group item analysis data only is available for evaluation purposes from the 1978-79 school year. Individual student data is available from the 1979-80 school year, and as soon as spring testing is completed, approximately 4000 students score pairs will be available for further analysis of process impact. An experimental design involving matched pair data for two school districts with over 1000 students who did not use the objective strength process, four districts with around 1000 students who have used the process for three years, and four districts with around 2000 students who have used the process for two years will be utilized in an analysis of covariance for each subtest.

For the moment, only group item analysis data routinely collected as the reports are generated is available.

What does the group item analysis data show?

In Table 1, differences between the state item norm percentage correct and the local schools' percentage correct are collapsed across grades, buildings, districts, and subtests to achieve a single norm vs. local district comparison for the vocabulary and nonvocabulary components of the ITBS.

A review of the data reveals that in every case the districts have gained ground on the state in each year of the comparison. In addition, the nonvocabulary scores have risen more rapidly than the vocabulary scores. The three-year comparison would also indicate that gains were greatest for the first year of the process.

Table 1. District vs. State Vocabulary and "Nonvocabulary" Differences in Average Percentage Correct Scores on ITBS for Districts With One and Two Years of Experience with the Objective Strength Process.

Test Area	1978-1979 Data			1979-1980 Data			1980-1981 Data		
	N	Grades	Diff.	N	Grades	Diff.	N	Grades	Diff.
Vocabulary	820	3-6	+2.60	822	4-7	+4.25	812	5-8	+4.50
NonVocabulary	820	3-6	+1.40	822	4-7	+4.10	812	5-8	+4.60
Vocabulary				1060	3-7	+1.30	1020	4-8	+3.15
Nonvocabulary				1060	3-7	-2.10	1020	4-8	+1.25

Discussion of the Results: Three factors could explain the observed increase in scores. 1) Faculty and students could place more emphasis on the test-taking process since, after the first year, the faculty see the test as being used to evaluate curricular impact. Prior to that time, the results were largely ignored. 2) Students may have been removed from the group and tested off-level. This data would then be excluded from the second analysis. 3) Curriculum being delivered to the students could better match the ITBS objective and therefore, students scores would be expected to rise.

No controls were built into this evaluation to assess faculty test-attentiveness, so point one in the above paragraph cannot be eliminated as one reason for improved scores. The match pair analysis currently being conducted will remove the impact if any of students being selectively pulled for off-level testing. However, the number of students being tested from year to year is remaining reasonably stable. Finally, work with faculties involved indicates that most gains are occurring in areas targeted for improvement the previous year and, therefore, it would appear that the school curriculum is moving toward a better match with the objectives being assessed.

Are the gains large enough to matter?

In rough terms, a percentage gain of 1.5 points translates into a grade equivalent gain of about 0.1 years. In rough grade equivalent terms, the average first year vocabulary gain for all students in all grades was about 0.1 months above the state average. The average nonvocabulary gain was about 0.2 months. At this point, we consider these gains sufficient to recommend continued use of the process for schools in our state. The upcoming analysis of covariance with match pairs of students will indicate whether this judgment should be retained.

For a copy of this updated paper when released in June, 1981, please write Bob King, Northern Trails Area Education Agency, Box M, Clear Lake, IA 50428.

An Analysis of Objective Strength Patterns from the Iowa Test of Basic Skills

Prepared by:
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Prepared for:

SAMPLE DATA
FOR
A SAMPLE SCHOOL DISTRICT

SUGGESTIONS FOR USING THIS REPORT

Purpose: This item analysis highlights strong and weak objectives from the Iowa Tests of Basic Skills. Following the suggestions below should allow you to identify 2 - 6 objectives in need of attention; and 2 - 6 that are particularly strong for your class(es).

1. Pull off the final green page in this booklet.

2. Look at the column headings. Identify the data from the class you are now teaching, and the one you taught last year. A sample heading is explained below.

```
Midyear test ----------M 80-------Given in 1980
Form 8 ---------------8 - 6 -----Test designed for 6th grade
Test given to 6th grade-----6 DIST-----Entire district was tested
33 students took the test---33
```

3. The numbers inside each box are explained at the base of the report pages.

4. For all tests, other than vocabulary, the central code indicates whether the class scores are within a range predicted from the vocabulary scores of your students. Minus codes indicate weak areas, and double minuses appear for especially weak objectives. For the vocabulary test, symbols indicate whether your scores are substantially different from the state average vocabulary scores.

5. Go through each odd-numbered page from 3 - 27, and record the number of items and strength codes on the green sheets for only those objectives receiving +'s or -'s in the boxes.

```
                I           I
 10      66 I 11      63 I
     ++     I      0     I
 82      16 I 79      16 I
------------I-----------I

  2      64 I  1      65 I
       0    I      --    I
 71       7 I 62      -3 I
             I           I
------------I-----------I
```

# items	Code (+,-)	# items	Code (+,-)
10	++		
		1	--

6. Consider any lines with two sets of negative or positive entries. Pick the 2 - 4 objectives which appear to have helped, and to have hurt your overall scores the most.

7. Following each objective in this report, two or more letters or numbers (i.e. F1) appear. These refer to the charts of ITBS objectives which appear on the even-numbered pages. By looking at these charts, you may note important differences in the numbers of specific items used in different form and grade levels.

8. Finally, the written information on the even-numbered pages contains ITBS suggestions for improving your students' scores.

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COMPOSITE SUMMARY -ANYTOWN,IOWA ITBS ITEM ANALYSIS

#	SUBTEST DESCRIPTION	DATE FORM CLASS #	ST	M 80 8- 3 3 DIST 81		M 80 8- 4 4 DIST 70		M 80 8- 5 5 DIST 68		M 80 8- 6 6 DIST 63		M 80 8- 7 7 DIST 61		M 80 8- 8 8 DIST 66		WEIGHTED TOTAL	
	VOCABULARY		30	74	36	68	39	66	42	65	43	64	44	64	39	67
			78	4	77	9	75	9	74	9	73	9	63	-1	73	6
	READING COMPREHENSION		44	72	49	65	54	64	56	62	57	60	58	60	53	64
			78	6	71	6	73	9	69	7	69	9	62	2	70	6
	SPELLING		30	73	36	71	40	67	42	62	43	61	44	62	39	66
			81	8	77	6	80	13	71	9	74	13	70	8	75	9
	CAPITALIZATION		29	65	29	67	30	68	30	67	31	64	32	59	30	65
			81	16	73	6	82	14	79	12	80	16	69	10	77	12
	PUNCTUATION		28	57	29	64	30	65	30	66	31	63	32	60	30	62
			74	17	66	2	80	15	80	14	80	17	70	10	75	13
	LANGUAGE USAGE		27	57	29	62	30	70	30	71	31	64	32	60	30	64
			62	5	64	2	81	11	78	7	78	14	68	8	71	7

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CODE USED IN CHART = I A B I / I C I / I D E I

A = NUMBER OF ITEMS B = AVG STATE PERCENT CORRECT
C = THE OBJECTIVE STRENGTH RANKING (WHERE ++ IS HIGH)
D = AVG SCHOOL % E = DIFF. BETWEEN SCHOOL & STATE

ADMINISTRATIVE SUMMARY [redacted] ITBS ITEM ANALYSIS

#	SUBTEST DESCRIPTION	DATE M 80 FORM 8- 3 CLASS 3 DIST # ST 81		M 80 8- 4 4 DIST 70		M 80 8- 5 5 DIST 68		M 80 8- 6 6 DIST 63		M 80 8- 7 7 DIST 61		M 80 8- 8 8 DIST 66		WEIGHTED TOTAL	
	INTERPRETATION OF VISUAL MATERIALS	36	64	40	61	46	56	49	48	52	51	54	53	46	55
		0	10	+ 4	- 15	+ 12	0	0	13	0	4	0	10		
		74		65		71		60		64		57		65	
	USING REFERENCE MATERIALS	37	63	44	67	45	67	46	66	47	65	48	65	44	65
		0	8	- 5	0	13	0	8	9	0	4	+	8		
		71		72		80		74		74		69		73	
	MATHEMATICS - CONCEPTS	28	69	32	60	37	58	40	59	42	58	44	55	37	60
		0	4	0 6	0	11	0	9	11	0	-1	0	6		
		73		66		69		68		69		54		66	
	MATHEMATICS - PROBLEM SOLVING	23	57	25	59	27	62	29	62	30	55	32	50	27	57
		0	5	0 7	+	14	0	12	10	0	2	0	8		
		62		66		76		74		65		52		65	
	MATHEMATICS - COMPUTATION	39	64	42	64	45	65	45	63	45	55	45	54	43	61
		0	5	0 14	+	14	+	15	++	18	-2	0	10		
		69		78		79		78		73		52		71	

CODE USED IN CHART ABOVE

A = NUMBER OF ITEMS B = AVG STATE PERCENT CORRECT
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D = AVG SCHOOL % E = DIFF. BETWEEN SCHOOL & STATE

ANYTOWN,IOWA ITBS ITEM ANALYSIS
FOR SUBTEST - VOCABULARY

#	OBJECTIVE DATA DESCRIPTION	DATE M 80 FORM 8- 3 CLASS 3 DIST # ST 81			M 80 8- 4 4 DIST 70			M 80 8- 5 5 DIST 68			M 80 8- 6 6 DIST 63			M 80 8- 7 7 DIST 61			M 80 8- 8 8 DIST 66			WEIGHTED TOTAL	
1	DETERMINING THE MEANING OF NOUNS IN CONTEXT. (N)	9	73		12	69		14	71		14	71		14	67		14	65		13	69	
		77	4		80	11		83	12		80	9		76	9		63	-2		76	7	
2	DETERMINING THE MEANING OF VERBS IN CONTEXT. (V)	8	83		9	71		10	64		13	63		14	64		15	65		11	68	
		85	2		78	7		72	8		72	9		72	8		66	1		73	5	
3	DETERMINING THE MEANING OF MODIFIERS AND CONNECTIVES IN CONTEXT. (M)	13	70		15	65		15	62		15	62		15	62		15	61		15	64	
		75	5		75	10		69	7		71	9		70	8		61	0		70	6	
	COMPOSITE AVERAGE	30	74		36	68		39	66		42	65		43	64		44	64		39	67	
		78	4		77	9		75	9		74	9		73	9		63	-1		73	6	

CODE USED IN CHART = ABOVE	A	B	C	D	E

A = NUMBER OF ITEMS B = AVG STATE PERCENT CORRECT
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Vocabulary

The Vocabulary test involves not only reading and word meaning but concept development. The classification of skills objectives is based on functional distinctions in concept development, i.e., the part that nouns, verbs, modifiers, and connectives play in the language.

Test V: Vocabulary

SKILLS OBJECTIVES — **NUMBER OF ITEMS**

	Form 7	Form 8
	GRADE LEVEL	GRADE LEVEL
	3 4 5 6 7 8	3 4 5 6 7 8
Nouns: Determining the Meaning of Nouns in Context (N)	8 9 9 12 13 14	9 12 14 14 14 14
Verbs: Determining the Meaning of Verbs in Context (V)	9 12 14 14 14 14	8 9 10 13 14 15
Modifiers and Connectives: Determining the Meaning of Adjectives, Adverbs, Prepositions, and Conjunctions in Context (M)	13 15 16 16 16 16	13 15 15 15 15 15
Totals	30 36 39 42 43 44	30 36 39 42 43 44

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Suggestions for Improving Vocabulary

Understanding the meanings of words is essential to all communication and learning. In general, the school can contribute to vocabulary power through a) planned, systematic instruction; b) informal instruction whenever the opportunity arises; c) wide reading of a variety of materials; and d) activities and experience, field trips, etc. One of the most important responsibilities of teachers in each subject area is to provide pupils with an understanding of the specialized vocabulary and concepts of the subject.

There are no known shortcuts to vocabulary instruction; vocabulary development is a continuous program. The following suggestions may prove helpful.

1. Keep the emphasis upon meaning rather than upon mere recognition or mechanical pronunciation of words.
2. Teach words in context, not in isolation.
3. Teach children to ask about any new, confusing, or unusual words as they encounter them.
4. Put such words on the board, and encourage their frequent use.
5. Make definite provision for word study and word building: explain origins of words, roots, affixes, compound words, etc.
6. Have frequent oral tests covering new words, using them in sentences, and discussing their meanings.
7. Give practice in synonyms and antonyms, both for words and for phrases.
8. Conduct discussions of differences in meanings of words that are similar but not identical. (Most dictionaries have "usage notes" and cross references that provide excellent materials for this purpose.)
9. Give pupils, particularly in the upper grades, experience in using a thesaurus.
10. Encourage children of different language backgrounds to share interesting words, concepts, and idioms.

[redacted] ITBS ITEM ANALYSIS

FOR SUBTEST - READING COMPREHENSION

#	OBJECTIVE DATA DESCRIPTION	DATE FORM CLASS # ST	M 80 8- 3 3 DIST 81	M 80 8- 4 4 DIST 70	M 80 8- 5 5 DIST 68	M 80 8- 6 6 DIST 63	M 80 8- 7 7 DIST 61	M 80 8- 8 8 DIST 66	WEIGHTED TOTAL
1	UNDERSTAND FACTUAL DETAILS RE PEOPLE, PLACE, OBJECTS, & EVENTS. (F1)	A	10	9	6	8	7	6	8
		C	0	-	0	0	0	0	
		D	87	76	70	68	78	75	77
		B	81	72	57	61	66	73	70
		E	6	4	13	7	12	2	7
2	UNDERSTAND CLASSIFICATIONS & DEDUCE MEANINGS FROM CONTEXT. (F2,F4)	A	8	8	8	8	10	9	8
		C	0	0	0	0	0	0	
		D	76	84	81	68	61	61	72
		B	70	77	74	62	56	59	66
		E	6	7	7	6	5	2	6
3	UNDERSTAND FUNCTIONAL RELATIONSHIPS, TIME, & SEQUENCE. (F3)	A	5	8	8	7	3	4	6
		C	0	0	0	-	0	0	
		D	79	67	76	71	75	56	71
		B	74	61	67	68	61	53	65
		E	5	6	9	3	14	3	6
4	INFER CAUSE & EFFECT AND DRAW CONCLUSIONS (I1,I2)	A	7	5	8	7	10	9	8
		C	0	0	0	0	0	0	
		D	75	74	77	76	67	57	70
		B	67	63	66	70	55	55	62
		E	8	11	11	6	12	2	8
5	INFER TRAITS, FEELINGS, & MOTIVES. (I3,I4)	A	7	10	9	7	4	2	7
		C	0	-	0	-	-	+	
		D	68	66	72	70	73	83	70
		B	64	63	65	68	69	76	65
		E	4	3	7	2	4	7	5

CODE USED IN CHART = ABOVE

A = NUMBER OF ITEMS B = AVG STATE PERCENT CORRECT
C = THE OBJECTIVE STRENGTH RANKING (WHERE ++ IS HIGH)
D = AVG SCHOOL % E = DIFF. BETWEEN SCHOOL & STATE

Reading Comprehension F & I

The second major class of skills objectives, inferences, is represented for the most part by *why*? questions. The four objectives are: understanding cause-and-effect relationships; drawing conclusions; inferring traits and feelings; and inferring motives and reasons for the actions of characters.

Objectives involving factual details and relationships are often represented by items of the who-what-when-where type. The first three skills objectives—description, categorization, and relationships—correspond to the descriptive, categorical, and relational cognitive style modes of information processing described by Kagen, Moss and Sigel, and by Robinson and Gray. The fourth objective is concerned with deducing the special meaning of words or phrases from context.

Test R: Reading

SKILLS OBJECTIVES — **NUMBER OF ITEMS**

	Form 7 GRADE LEVEL 3 4 5 6 7 8	Form 8 GRADE LEVEL 3 4 5 6 7 8
F Facts: To Recognize and Understand Stated Factual Details and Relationships (Literal Meaning)	23 21 18 17 18 23	23 25 22 23 20 19
F1 Description: To understand factual details relating to description of people, places, objects, and events	13 13 10 9 7 8	10 9 6 8 7 6
F2 Categorization: To understand factual details relating to classification	3 3 2 1 1 4	4 5 5 5 6 5
F3 Relationships: To understand functional relationships, time, and sequence	5 4 5 6 7 7	5 8 8 7 3 4
F4 Contextual Meaning: To deduce the meanings of words or phrases from context	2 1 1 1 3 4	4 3 3 3 4 4
I Inferences: To Infer Underlying Relationships (Interpretative Meaning)	11 14 17 19 17 13	14 15 17 14 14 11
I1 Cause and Effect: To understand cause, effect, concomitance, and interaction	1 3 5 5 3 1	2 4 4 2 5 5
I2 Draw Conclusions: To draw conclusions from information and relationships	6 7 7 6 6 5	5 1 4 5 5 4
I3 Traits and Feelings: To infer traits, feelings, and emotions of characters	2 1 1 5 5 5	1 3 4 4 2 1
I4 Motives: To infer the motives and reasons for the actions of characters	2 3 4 3 3 2	6 7 5 3 2 1

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(Continued on next page)

Suggestions for Developing Skill in Recognizing and Understanding Stated Factual Details and Relationships

1. When asking questions about factual details, avoid the terminology of the text. Ask questions that cannot be answered by "word-matching."
2. Ask pupils to describe people, places, objects, and events in language other than that used in a passage. Encourage directness, brevity, and accuracy.
3. Ask pupils to describe similarities and differences between characters and events.
4. Provide exercises that require pupils to arrange in order a sequence of events, as in an anecdote, or a sequence of processes, as in a science experiment.
5. When words or phrases used in the passage have unusual meanings or connotations, have pupils deduce the special meanings from context.
6. Ask pupils to find details which support a given topic sentence or main idea.
7. Ask pupils to identify irrelevant details which do not contribute to the main points of the selection.
8. Frequently give directions for lessons in written form so that children will learn to follow printed directions.
9. In no case, from the first grade on, permit verbalism (the mere reading of words). Insist that children know what they are reading about.

Suggestions for Developing Skill in Inferring Underlying Relationships

1. Ask questions that require interpretation, thought, and inference. Have pupils support their conclusions with factual details from the passage.
2. Ask questions that require students to clarify cause and effect. Point out instances in which cause and effect is not clear, or in which there are alternative causes or explanations.
3. Employ questions that require the pupils to draw conclusions and make inferences in order to arrive at answers that are not definitely stated in the context. (The tests provide many illustrations of this type of question.)
4. Ask questions about characterization. Conduct discussions about traits and motivations of characters and how they felt as a result of actions and events.

[redacted] ITBS ITEM ANALYSIS
FOR SUBTEST - READING COMPREHENSION

#	OBJECTIVE DATA DESCRIPTION	DATE FORM CLASS # ST	M 80 8- 3 3 DIST 81	M 80 8- 4 4 DIST 70	M 80 8- 5 5 DIST 68	M 80 8- 6 6 DIST 63	M 80 8- 7 7 DIST 61	M 80 8- 8 8 DIST 66	WEIGHTEI TOTAL
6	DEVELOP GENERALI-	A	2	2	6	6	10	9	6	55
	ZATIONS CONCERNING	C	-	0	0	0	0	0		
	MAIN IDEA & ORGANI-	D	71	76	70	68	70	59	67	8
	ZATION. (G1,G2)	E	-1	12	13	8	11	2		
7	DEVELOP GENERAL. RE	A	5	7	9	13	13	19	11	59
	APPLICATIONS,PURPOSE	C	0	0	0	0	0	0		
	LANGUAGE, VIEWPOINT,	D	80	61	69	64	67	61	65	6
	MOOD & STYLE.(G3-G8)	E	8	6	9	10	7	1		
	COMPOSITE AVERAGE	A	44	49	54	56	57	58	53	64
		C	0	0	0	0	0	0		
		D	78	71	73	69	69	62	70	6
		E	6	6	9	7	9	2		

CODE USED IN CHART = ABOVE

A = NUMBER OF ITEMS B = AVG STATE PERCENT CORRECT
C = THE OBJECTIVE STRENGTH RANKING (WHERE ++ IS HIGH)
D = AVG SCHOOL % E = DIFF. BETWEEN SCHOOL & STATE

Reading Comprehension G

Objectives in the third category, generalizations, involve higher order skills concerned with main ideas, organization, application, purpose and viewpoint of the author, and the structure, mood, or style of the selection.

Although research has demonstrated that performances on tests measuring the various skills objectives are highly related, for purposes of instruction it is useful to consider each of the skills separately. To produce effective, thoughtful, critical readers it is necessary to provide specific learning experiences in each of the skills.

Test R: Reading

SKILLS OBJECTIVES — **NUMBER OF ITEMS**

	Form 7						Form 8					
	GRADE LEVEL						GRADE LEVEL					
	3	4	5	6	7	8	3	4	5	6	7	8
G Generalizations: To Develop Generalizations from a Selection (Evaluative Meaning)	10	14	19	20	22	22	7	9	15	19	23	28
G1 Main Idea: To recognize the main idea or topic of a paragraph or selection	5	4	6	5	5	5	2	2	3	3	6	8
G2 Organization: To understand the organization of a paragraph or selection	1	1	3	2	3	1	•	•	3	3	4	1
G3 Application: To apply information through generalization or prediction	2	2	3	1	3	2	5	4	6	5	5	5
G4 Purpose: To recognize the author's purpose, motive, or intention	2	4	4	4	4	3	•	•	•	1	2	2
G5 Viewpoint: To recognize the author's viewpoint, attitude, or bias	•	1	1	2	1	2	•	•	•	2	2	4
G6 Figurative Language: To interpret figurative language	•	1	1	4	3	4	•	3	3	4	2	5
G7 Mood: To recognize the mood or tone of a selection	•	•	•	•	1	2	•	•	•	1	1	2
G8 Style: To recognize qualities of style or structure	•	1	1	2	2	3	•	•	•	•	1	1
Reading F.I. & G Totals	44	49	54	56	57	58	44	49	54	56	57	58

Suggestions for Developing Skill in Making Generalizations

1. Have pupils provide orally or in writing their own statements of the topic sentence of single paragraphs.
2. Provide multiple-choice exercises in which pupils identify the main idea(s) of paragraphs, or longer selections, in which there are no clear-cut statements of the central idea.
3. Have pupils state in their own words the main idea(s) of paragraphs or longer selections which do not contain a definite topic sentence.
4. Ask questions such as, "What was the author's purpose in writing this article?" or "What is the one most important thing to remember from the selection?"
5. Include definite instruction in outlining. Beginning with simple paragraphs, identify the main idea, and indicate how many subpoints are to be listed by the pupils. Next, use single paragraphs with the main ideas identified, but without any indication of the number of supporting ideas the pupils are to list. Graduate from this to single paragraphs that must be organized by the pupil with neither the main idea nor the supporting details provided by a teacher-made skeleton outline.

   Have pupils outline increasingly longer and more complex passages. Provide them with some guidance through skeleton outlines at first, and then allow them to outline equally complex material without the aid of a skeleton.

   Finally, in connection with content subjects, provide opportunities for pupils to organize reading material from more than one source.
6. Capitalize on situations that provide opportunities for pupils to give oral or written personal judgments of stories, articles, or shorter reading selections. Do not be concerned about their failure to express absolutely correct interpretations but inductively lead the pupils to better judgments when their own opinions are not defensible.
7. Set up exercises that provide pupils with opportunities for differentiating between facts and opinions.
8. At the upper grade levels, occasionally ask of some inaccurate or slanted reading matter, "Why are we inclined to believe this?" or "What is it about us that tempts us to accept this?"
9. Utilize exercises that call for differentiating between emotive and informative selections.
10. When the opportunity exists, consider orally the mood or tone of an article or the feeling that it induces in the reader.
11. When unusual writing style or organization is employed by the writer, discuss it with the class. Ask why the author wrote this way and how it affects the reader.

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[redacted] ITBS ITEM ANALYSIS

FOR SUBTEST - SPELLING

#	OBJECTIVE DESCRIPTION	DATE M 80 FORM 8- 3 CLASS 3 DIST # ST 81	M 80 8- 4 4 DIST 70	M 80 8- 5 5 DIST 68	M 80 8- 6 6 DIST 63	M 80 8- 7 7 DIST 61	M 80 8- 8 8 DIST 66	WEIGHTED TOTAL
1	WORDS WITH CONSONANT SUBSTITUTIONS ARE NOT DETECTED. (CS)	A 6 C 0 D 82 B 74 E 8	A 7 C 0 D 79 B 73 E 6	A 6 C 0 D 79 B 68 E 11	A 6 C 0 D 76 B 66 E 10	A 8 C 0 D 79 B 67 E 12	A 6 C + D 82 B 74 E 8	A 6 D 79 B 71 E 8
2	WORDS WITH CONSONANT REVERSALS OR OMISSIONS ARE NOT DETECTED. (CR & CO)	A 3 C 0 D 76 B 70 E 6	A 6 C 0 D 75 B 63 E 12	A 7 C + D 81 B 66 E 15	A 5 C 0 D 75 B 66 E 9	A 4 C + D 78 B 62 E 16	A 5 C + D 67 B 60 E 7	A 5 D 75 B 64 E 11
3	WORDS WITH UN-NECESSARY OR DOUBLE CONSONANTS ARE NOT DETECTED.(CA&CD)	A 4 C 0 D 71 B 65 E 6	A 5 C -- D 67 B 65 E 2	A 5 C 0 D 80 B 71 E 9	A 6 C - D 66 B 61 E 5	A 6 C 0 D 69 B 58 E 11	A 7 C + D 64 B 57 E 7	A 5 D 69 B 62 E 7
4	WORDS WITH VOWEL SUBSTITUTIONS ARE NOT DETECTED. (VS)	A 7 C + D 86 B 75 E 11	A 8 C - D 81 B 76 E 5	A 9 C + D 79 B 64 E 15	A 10 C 0 D 71 B 60 E 11	A 10 C + D 74 B 61 E 13	A 10 C + D 71 B 63 E 8	A 9 D 77 B 66 E 11
5	WORDS WITH VOWEL REVERSALS, OMISSIONS & ADDITIONS ARE NOT DETECTED. (VR,VO,VA)	A 5 C 0 D 78 B 73 E 5	A 5 C 0 D 76 B 69 E 7	A 8 C 0 D 79 B 68 E 11	A 9 C - D 68 B 63 E 5	A 8 C + D 70 B 56 E 14	A 9 C ++ D 65 B 55 E 10	A 7 D 72 B 63 E 9
6	WORD SETS WHICH ARE FREE OF ERRORS ARE NOT DETECTED. (NM)	A 5 C ++ D 87 B 77 E 10	A 5 C 0 D 85 B 77 E 8	A 5 C + D 84 B 70 E 14	A 6 C 0 D 72 B 60 E 12	A 7 C + D 75 B 60 E 15	A 7 C + D 71 B 65 E 6	A 6 D 79 B 68 E 11
28	COMPOSITE AVERAGE	A 30 C + D 81 B 73 E 8	A 36 C 0 D 77 B 71 E 6	A 40 C 0 D 80 B 67 E 13	A 42 C 0 D 71 B 62 E 9	A 43 C 0 D 74 B 61 E 13	A 44 C + D 70 B 62 E 8	A 39 29 D 75 B 66 E 9

CODE USED IN CHART = ABOVE

A = NUMBER OF ITEMS B = AVG STATE PERCENT CORRECT
C = THE OBJECTIVE STRENGTH RANKING (WHERE ++ IS HIGH)
D = AVG SCHOOL % E = DIFF. BETWEEN SCHOOL & STATE

9

Spelling

The item classification system for Test L-1: Spelling is based upon error types. For each item, the type of error is indicated for the one word in four (if any) that is misspelled. Of course, pupils may in fact commit a double error in overlooking a misspelled word and in marking as wrong a word that is correctly spelled.

Test L-1: Spelling
SKILLS OBJECTIVES

NUMBER OF ITEMS

	Form 7						Form 8					
	GRADE LEVEL						GRADE LEVEL					
	3	4	5	6	7	8	3	4	5	6	7	8
CS Consonant Substitution	5	6	6	5	6	5	6	7	6	6	8	6
CR Consonant Reversals	2	2	2	2	2	2	2	4	4	3	3	3
CO Omission of Consonants	3	3	2	2	2	3	1	2	3	2	1	2
CA Addition of Unnecessary Consonants	1	2	2	2	2	3	1	1	1	2	3	3
CD Double Consonants	2	3	4	5	4	4	3	4	4	4	3	4
VS Vowel Substitution	6	7	8	10	10	11	7	8	9	10	10	10
VR Vowel Reversals	•	1	2	3	2	3	1	2	4	4	3	3
VO Omission of Vowels	5	5	6	5	5	4	3	2	2	2	3	4
VA Addition of Unnecessary Vowels	1	[illegible]				2	1	1	2	3	2	2
NM No Mistakes	5	5	5	6	7	7	5	5	5	6	7	7
Totals	30	36	40	42	43	44	30	36	40	42	43	44

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Suggestions for Developing Spelling Ability

1. Convince pupils that spelling is important and that spelling errors are heavily penalized academically, professionally, and socially. Try to get pupils to take pride in correct spelling in all written work. How well a pupil learns to spell depends largely upon interest and desire to improve.
2. Develop sensitivity to spelling errors. Give pupils practice in proofreading their own and other written work, lists of words, and printed or typed words misspelled in context.
3. Supplement group teaching with individual diagnosis, help, and encouragement.
4. Take advantage of potential contributions to spelling skills from other curriculum areas: word-attack skills learned in reading, correction of poor speech habits or deficiencies, attention to correct spelling in handwriting, use of the content areas as sources of spelling words of high social utility and immediate need.
5. Encourage each pupil to develop a systematic approach to learning to spell new words.
6. Encourage the use of the dictionary in learning to spell new words. Discuss possible ways a new word might be spelled before looking it up.
7. Provide variety in method. There is no substitution for ingenious, resourceful teaching.

[redacted] ITBS ITEM ANALYSIS
FOR SUBTEST - CAPITALIZATION

#	OBJECTIVE DATA DESCRIPTION	DATE FORM CLASS # ST	M 80 8- 3 3 DIST 81	M 80 8- 4 4 DIST 70	M 80 8- 5 5 DIST 68	M 80 8- 6 6 DIST 63	M 80 8- 7 7 DIST 61	M 80 8- 8 8 DIST 66	WEIGHTED TOTAL
1	CAPITALIZES NAMES AND TITLES. (1A-1E)	A	7	5	5	3	4	3	5
		C	++	0	+	0	+	+	
		B	67	72	74	72	66	59	69
		D	84	79	89	82	83	67	82
		E	17	7	15	10	17	8	13
2	CAPITALIZES DATES & HOLIDAYS. (2A-2C)	A	6	5	4	2	2	2	4
		C	++	-	0	0	0	++	
		B	70	78	87	84	68	71	76
		D	88	82	95	92	75	83	86
		E	18	4	8	8	7	12	10
3	CAPITALIZES PLACE NAMES (3A-3F)	A	3	6	6	8	6	5	6
		C	++	-	+	0	++	+	
		B	70	62	61	65	56	53	61
		D	86	64	76	78	79	61	74
		E	16	2	15	13	23	8	13
4	CAPITALIZES GROUPS & ORGANIZATIONS. (4A-4F)	A	1	2	5	6	6	6	4
		C	++	0	+	+	+	++	
		B	38	41	57	67	68	60	60
		D	59	55	74	82	82	74	75
		E	21	14	17	15	14	14	15
5	FOLLOWS LINGUISTIC CONVENTIONS (IE CAPS FOR THE 1ST WRD IN A SENTENCE).(5A-5E)	A	6	5	4	5	6	7	6
		C	++	0	++	0	++	++	
		B	51	56	62	58	64	63	59
		D	70	65	80	71	85	73	73
		E	19	9	18	13	21	10	14
6	RECOGNIZES OVER-CAPITALIZATION & ERROR FREE LINES. (OV AND NM)	A	5	6	6	6	7	9	6
		C	+	0	0	0	0	+	
		B	76	75	70	67	64	56	67
		D	86	81	79	80	73	64	76
		E	10	6	9	13	9	8	9
	COMPOSITE AVERAGE	A	28	29	30	30	31	32	30
		C	++	0	+	0	+	++	
		B	65	67	68	67	64	59	65
		D	81	73	82	79	80	69	77
		E	16	6	14	12	16	10	12

CODE USED IN CHART = ABOVE

A = NUMBER OF ITEMS B = AVG STATE PERCENT CORRECT
C = THE OBJECTIVE STRENGTH RANKING (WHERE ++ IS HIGH)
D = AVG SCHOOL % E = DIFF. BETWEEN SCHOOL & STATE

Capitalization

Test L-2 Capitalization
SKILLS OBJECTIVES

	NUMBER OF ITEMS											
	Form 7						Form 8					
	GRADE LEVEL						GRADE LEVEL					
	3	4	5	6	7	8	3	4	5	6	7	8
1 Names and Titles (NT)	7	5	5	4	4	3	7	5	5	3	4	3
1A Names of persons or animals and initials of persons	3	2	2	1	2	1	4	2	2	1	2	1
1B The pronoun I	2	1	•	•	•	•	2	1	•	•	•	•
1C Titles of respect, honor, or rank	1	1	1	1	1	1	1	1	1	•	1	1
1D Words indicating family relationships, when used without a possessive pronoun	1	1	2	2	1	•	•	1	2	2	1	•
1E Expressions used for the Deity and the Bible	•	•	•	•	•	1	•	•	•	•	•	1
2 Dates and Holidays (DH)	6	5	4	2	2	2	6	5	4	2	2	2
2A Names of the days of the week	3	2	1	•	•	•	3	2	1	•	•	•
2B Names of months	2	1	1	•	•	•	2	1	1	1	1	1
2C Names of holidays and religious days	1	2	2	2	2	2	1	2	2	1	1	1
3 Place Names (PN)	3	6	6	8	7	6	3	6	6	8	6	5
3A Names of cities and states	1	1	1	1	•	•	1	1	1	2	1	1
3B Names of streets, avenues, etc.	1	2	1	2	1	2	1	2	1	1	•	1
3C Names of buildings, schools, parks, etc.	•	•	1	1	2	1	•	•	1	1	2	1
3D Names of rivers, oceans, canals, mountains, etc.	•	1	2	2	2	1	•	1	2	2	1	•
3E Names of countries and continents	1	2	1	2	1	1	1	2	1	2	1	1
3F Nouns which designate definite geographic portions of a country or the world	•	•	•	•	1	1	•	•	•	•	1	1
4 Organizations and Groups (OG)	1	2	5	5	5	5	1	2	5	6	6	6
4A Names of organizations	•	1	2	2	1	1	•	1	2	3	2	2
4B Names of political, racial, or religious groups	•	1	1	1	1	1	•	1	1	1	1	1
4C Names of things: ships, planes, etc.	1	•	•	•	•	•	•	•	•	•	•	•
4D Names of brands or products	•	•	1	1	1	1	1	•	1	1	1	1
4E Names of historical periods or events	•	•	•	•	•	1	•	•	•	•	•	1
4F Proper adjectives	•	•	1	1	2	1	•	•	1	1	2	1
5 Linguistic Conventions (LC)	6	5	4	5	6	7	6	5	4	5	6	7
5A First word of a sentence	3	2	1	1	1	1	3	2	1	1	1	1
5B First word in a quotation	•	•	•	1	2	3	•	•	•	1	2	3
5C Titles of books, music, magazines, plays, etc.	1	1	1	1	1	1	1	1	1	1	1	1
5D In writing letters, the first word and the word which stands in place of the person's name in the salutation	1	1	1	1	1	1	1	1	1	1	1	1
5E In writing letters, the first word of the complimentary close	1	1	1	1	1	1	1	1	1	1	1	1
OV Overcapitalization	•	1	2	3	4	6	•	1	2	3	4	6
NM No Mistakes	5	5	4	3	3	3	5	5	4	3	3	3
Totals	28	29	30	30	31	32	28	29	30	30	31	32

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The skills objectives for Test L-2: Capitalization are identified and listed in considerable detail. They have been grouped into major categories as follows: names and titles, dates and holidays, place names, organizations and groups, linguistic conventions, and (avoidance of) over-capitalization.

Suggestions for Developing Capitalization Skills

1. Emphasize the importance of careful use of capitals in all written work.
2. Have pupils edit their own or others' papers with special reference to capitalization.
3. Use proofreading and dictation exercises emphasizing the types of situations that have been identified as causing difficulty.
4. Have pupils compile a list of the words that they frequently fail to capitalize, or that they frequently overcapitalize. Give exercises emphasizing these special situations and acquaint them with the rules covering such situations.
5. Give special attention to handwriting if that is the cause of some capitalization faults.
6. Give the pupils experience in verifying their use of capitals in standard sources. The purpose of this activity is to acquaint the pupils with irregularities in capitalization practices and with sources commonly used as standards.

[redacted] ITBS ITEM ANALYSIS
FOR SUBTEST - PUNCTUATION

#	OBJECTIVE DATA DESCRIPTION	DATE M 80 FORM 8- 3 CLASS 3 DIST # ST 81	M 80 8- 4 4 DIST 70	M 80 8- 5 5 DIST 68	M 80 8- 6 6 DIST 63	M 80 8- 7 7 DIST 61	M 80 8- 8 8 DIST 66	WEIGHTED TOTAL
1	RECOGNIZES THE NEED FOR TERMINAL PUNCTUATION. (1A-1C)	A 14 B 65 C ++ D 84 E 19	A 11 B 69 C - D 71 E 2	A 8 B 61 C + D 78 E 17	A 5 B 63 C ++ D 82 E 19	A 4 B 59 C ++ D 85 E 26	A 2 B 61 C ++ D 73 E 12	A 8 B 64 C D 79 E 15
2	RECOGNIZES THE NEED FOR COMMAS.(2A-2M)	A 7 B 41 C ++ D 61 E 20	A 8 B 55 C -- D 54 E -1	A 10 B 64 C 0 D 78 E 14	A 9 B 62 C 0 D 75 E 13	A 12 B 65 C + D 80 E 15	A 16 B 63 C ++ D 71 E 8	A 10 B 59 C D 71 E 12
3	RECOGNIZES THE NEED FOR : ; ' AND " " MARKS. (3A-3D)	A 3 B 45 C ++ D 59 E 14	A 5 B 64 C - D 68 E 4	A 6 B 69 C ++ D 88 E 19	A 9 B 68 C ++ D 84 E 16	A 6 B 67 C ++ D 83 E 16	A 7 B 58 C ++ D 68 E 10	A 6 B 63 C D 77 E 14
4	RECOGNIZES PASSAGES EITHER OVERLY OR CORRECTLY PUNCTUATED (4A-4G &NM)	A 4 B 66 C 0 D 73 E 7	A 5 B 66 C - D 72 E 6	A 6 B 69 C 0 D 76 E 7	A 7 B 70 C 0 D 78 E 8	A 9 B 61 C + D 77 E 16	A 7 B 56 C ++ D 68 E 12	A 6 B 64 C D 74 E 10
	COMPOSITE AVERAGE	A 28 B 57 C ++ D 74 E 17	A 29 B 64 C - D 66 E 2	A 30 B 65 C + D 80 E 15	A 30 B 66 C + D 80 E 14	A 31 B 63 C ++ D 80 E 17	A 32 B 60 C ++ D 70 E 10	A 30 B 62 C D 75 E 13

CODE USED IN CHART = A B C D E
ABOVE

A = NUMBER OF ITEMS B = AVG STATE PERCENT CORRECT
C = THE OBJECTIVE STRENGTH RANKING (WHERE ++ IS HIGH)
D = AVG SCHOOL % E = DIFF. BETWEEN SCHOOL & STATE

Punctuation

Test L-3 Punctuation
SKILLS OBJECTIVES

	NUMBER OF ITEMS											
	Form 7						Form 8					
	GRADE LEVEL						GRADE LEVEL					
	3	4	5	6	7	8	3	4	5	6	7	8
1 Use of Terminal Punctuation (TP)	15	12	10	7	6	4	14	11	8	5	4	2
1A Use of period												
1A.1 at end of complete declarative sentence	5	4	3	2	1	•	5	3	1	•	•	•
1A.2 with initials or abbreviations	5	4	3	3	2	2	4	3	2	1	•	•
1B Use of question mark	5	4	4	2	2	1	5	4	4	3	3	1
1C Use of exclamation mark	•	•	•	•	1	1	•	1	1	1	1	1
2 Use of Comma (CM)	4	6	7	6	8	13	7	8	10	9	12	16
2A To separate names of city and state	•	1	2	2	1	•	•	1	2	2	1	•
2B To separate date of month and year	2	1	•	•	•	•	3	2	1	1	1	1
2C At end of salutation in friendly letter	1	1	1	•	•	•	1	1	1	•	•	•
2D At end of complimentary close of letter	1	1	1	1	1	1	1	1	1	1	1	1
2E To set off "yes" and "no"	•	•	•	•	•	1	•	•	•	•	•	1
2F To set off introductory or parenthetical adverbs	•	•	•	•	•	1	•	•	•	•	•	1
2G In direct address, to set off name of person addressed	•	•	•	•	•	1	•	•	•	•	•	1
2H To set off words in apposition	•	•	•	•	1	2	•	•	•	1	2	3
2I To separate words in series	•	2	3	3	2	2	2	3	5	4	4	3
2J-2M Other Comma Uses	.	.	.	.	**3**	**5**	.	.	.	.	**3**	**5**
3 Other Punctuation: Use of Apostrophe, Quotation Marks, Colon, and Semicolon (OP)	3	5	6	9	6	7	3	5	6	9	6	7
3A Use of apostrophe												
3A.1 in contractions	1	3	3	3	1	•	1	3	3	3	1	•
3A.2 in forming the possessive	•	1	1	1	•	1	•	1	1	1	•	1
3B Use of quotation marks												
3B.1 before and after a direct quotation	1	1	1	1	1	1	1	1	1	1	1	1
3B.2 with titles	•	•	•	1	1	1	•	•	•	1	1	1
3B.3 position with reference to other punctuation	•	•	•	•	•	1	•	•	•	•	•	1
3C Use of colon	**1**	.	**1**	**2**	**2**	**2**	**1**	.	**1**	**2**	**2**	**2**
3D Use of semicolon to separate coordinate clauses not joined by a conjunction	•	•	•	1	1	1	•	•	•	1	1	1
4 Over-punctuation (OV)	2	2	4	5	8	5	1	2	3	4	6	4
4A Use of terminal punctuation between phrases or clauses	1	1	•	•	•	•	1	1	•	•	•	•
4B Use of comma to mark a trivial pause	1	1	2	1	2	1	•	•	1	1	1	•
4C Use of comma between a word and the modifier immediately preceding it	•	•	1	1	1	•	•	1	2	2	1	•
4D Use of comma to set off restrictive clauses or phrases	•	•	•	1	1	1	•	•	•	•	1	1
4E Use of apostrophe in plurals of nouns	•	•	1	1	2	1	•	•	•	•	1	1
4F Use of apostrophe in words ending in s	•	•	•	•	1	1	•	•	•	•	1	1
4G Use of quotation marks with indirect quotations and unquoted matter	•	•	•	1	1	1	•	•	•	1	1	1
NM No Mistakes (NM)	4	4	3	3	3	3	3	3	3	3	3	3
Totals	28	29	30	30	31	32	28	29	30	30	31	32

Punctuation skills are highly specific and subject to direct teaching. In the classification system for Test L-3: Punctuation, use of period, question mark, and exclamation mark have been grouped together as "terminal punctuation." The various uses of the comma constitute a second major category. Other punctuation—use of apostrophe, quotation marks, colon, and semicolon—have been grouped together as a third class. The fourth major category consists of the various situations in which pupils frequently over-punctuate, i.e., use of punctuation where none is required.

Suggestions for Developing Punctuation Skills

1. Emphasize the importance of good form in writing.
2. Stress the relation of sentence structure to punctuation.
3. Have pupils critically edit their papers and those of other pupils.
4. Give practice in inserting punctuation into unpunctuated material.
5. Use dictation drills calling for use of certain punctuation skills or for the avoidance of excessive punctuation.
6. Give individual and group drill on proofreading written materials that emphasize the specific skills in which pupils are deficient.
7. Emphasize the importance of self-criticism in pupils' daily written work.

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[redacted] ITBS ITEM ANALYSIS
FOR SUBTEST - LANGUAGE USAGE

#	OBJECTIVE DATA DESCRIPTION	DATE FORM CLASS # ST	M 80 8- 3 3 DIST 81	M 80 8- 4 4 DIST 70	M 80 8- 5 5 DIST 68	M 80 8- 6 6 DIST 63	M 80 8- 7 7 DIST 61	M 80 8- 8 8 DIST 66	WEIGHTED TOTAL
1	RECOGNIZES INCORRECT VERB USAGE. (1A-1D)	A	9	11	12	11	10	11	11
		C	0	--	0	0	0	++	
		D	62	67	79	74	73	69	71
		E	5	2	9	5	7	10	7
2	RECOGNIZES INCORRECT PRONOUN USAGE. (2A-2D)	A	5	4	4	3	4	4	4
		C	+	--	0	0	0	++	
		D	72	61	78	86	76	75	74
		E	8	-2	8	9	12	10	8
3	RECOGNIZES INCORRECT MODIFIER USAGE. (3A-3D)	A	3	4	4	6	7	8	5
		C	0	0	0	0	++	+	
		D	58	71	86	74	74	66	72
		E	5	9	11	6	19	9	11
4	RECOGNIZES WORDS USED INCORRECTLY WITHIN CONTEXT. (4A-4D)	A	7	7	7	7	7	6	7
		C	0	--	+	0	++	0	
		D	52	52	78	77	87	64	67
		E	4	1	15	6	20	3	8
5	RECOGNIZES PASSAGES ILLUSTRATING CORRECT ENGLISH USAGE. (NM)	A	3	3	3	3	3	3	3
		C	-	--	+	0	0	0	
		D	69	76	90	90	86	72	80
		E	-4	-2	12	9	10	3	4
	COMPOSITE AVERAGE	A	27	29	30	30	31	32	30
		C	0	--	0	0	+	+	
		D	62	64	81	78	78	68	71
		E	5	2	11	7	14	8	7

CODE USED IN CHART = ABOVE

A = NUMBER OF ITEMS B = AVG STATE PERCENT CORRECT
C = THE OBJECTIVE STRENGTH RANKING (WHERE ++ IS HIGH)
D = AVG SCHOOL % E = DIFF. BETWEEN SCHOOL & STATE

Usage

The sixteen skills objectives for Test L-4: Usage are classified into four major categories: use of verbs, use of pronouns, use of modifiers, and miscellaneous usages in context. The skills are all concerned with "standard" English usage. The situations are sampled from both formal and informal written materials.

Test L-4: Usage

SKILLS OBJECTIVES	NUMBER OF ITEMS											
	Form 7						Form 8					
	GRADE LEVEL						GRADE LEVEL					
	3	4	5	6	7	8	3	4	5	6	7	8
1 Use of Verbs (UV)	9	11	11	10	9	11	9	11	12	11	10	11
1A Agreement of subject and verb	2	3	3	2	2	2	2	3	3	2	2	2
1B The past tense	3	3	3	3	2	2	3	4	4	4	2	2
1C The past participle	3	3	3	3	3	4	3	3	3	3	3	4
1D Miscellaneous verb forms	1	2	2	2	2	3	1	1	2	2	3	3
2 Use of Pronouns (UP)	5	4	4	3	4	4	5	4	4	3	4	4
2A Order of first person pronouns	2	1	1	•	•	•	2	1	1	•	•	•
2B Case forms	3	3	3	3	2	1	3	3	3	2	2	1
2C Agreement with antecedent	•	•	•	•	1	1	•	•	•	•	•	1
2D Miscellaneous pronoun forms	•	•	•	•	1	2	•	•	•	1	2	2
3 Use of Modifiers (UM)	4	5	4	6	7	8	3	4	4	6	7	8
3A Comparative and superlative forms	3	3	2	2	2	2	2	2	2	2	1	2
3B Articles	1	1	•	•	1	1	1	1	•	•	1	1
3C Adjective-adverb substitution	•	•	•	•	•	1	•	•	•	1	1	2
3D Miscellaneous modifying forms	•	1	2	4	4	4	•	1	2	3	3	3
4 Use of Context (UC)	6	6	8	8	8	6	7	7	7	7	7	6
4A Double negatives	1	1	2	3	3	3	2	2	3	4	4	3
4B Redundancies	2	3	3	3	3	2	2	3	3	3	3	2
4C Homonyms	1	1	1	1	1	1	1	1	•	•	•	1
4D Plural forms	2	1	2	1	1	•	2	1	1	•	•	•
NM No Mistakes	3	3	3	3	3	3	3	3	3	3	3	3
Totals	27	29	30	30	31	32	27	29	30	30	31	32

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Suggestions for Developing Usage Skills

1. Call attention to the individual's errors in usage. Contrast the correct form with the one to be avoided.
2. Have pupils prepare lists of usage situations that give them the most trouble.
3. Have pupils prepare sentences employing correct usage in each of the troublesome situations.
4. Prepare sentences containing usage errors. Have pupils correct the errors by making changes in the sentences.
5. Because usage is influenced by attitudes as well as knowledge, try to convince pupils of the importance of appropriate usage in everyday situations.
6. Conduct discussions of the reasons that usages differ in formal speech, informal conversation, and written forms, and for people from different language or cultural backgrounds.

[redacted] ITBS ITEM ANALYSIS

FOR SUBTEST - INTERPRETATION OF VISUAL MATERIALS

#	OBJECTIVE DATA DESCRIPTION	DATE FORM CLASS # ST	M 80 8- 3 3 DIST 81	M 80 8- 4 4 DIST 70	M 80 8- 5 5 DIST 68	M 80 8- 6 6 DIST 63	M 80 8- 7 7 DIST 61	M 80 8- 8 8 DIST 66	WEIGHTED TOTAL
1	LOCATES & DESCRIBES PLACES USING MAPS. (1A-1D)	A	10	8	11	9	8	6	9
		B	58	62	58	51	57	55	57
		C	+	-	++	+	+	++	
		D	71	65	76	67	74	65	70
		E	13	3	18	16	17	10	13
2	DETERMINES DIRECTION USING MAPS. (2A-2C)	A	3	2	1	2	2	3	2
		B	70	74	65	35	44	42	55
		C	0	--	0	0	0	-	
		D	79	73	75	44	54	35	60
		E	9	-1	10	9	10	-7	5
3	DETERMINES DISTANCE USING MAPS. (3A-3C)	A	7	6	5	2	2	5	5
		B	57	56	52	40	38	40	51
		C	+	-	0	0	0	0	
		D	66	60	65	53	46	44	58
		E	9	4	13	13	8	4	7
4	INTERPRETS DATA AND INFERS BEHAVIOR & LIVING CONDITIONS USING MAPS (4,5A-5D)	A	6	12	12	18	17	19	14
		B	52	54	60	51	54	58	55
		C	+	-	+	0	+	+	
		D	65	57	77	65	69	65	66
		E	13	3	17	14	15	7	11

CODE USED IN CHART = ABOVE

A = NUMBER OF ITEMS B = AVG STATE PERCENT CORRECT
C = THE OBJECTIVE STRENGTH RANKING (WHERE ++ IS HIGH)
D = AVG SCHOOL % E = DIFF. BETWEEN SCHOOL & STATE

Visual Materials Map Reading

There are eight major skills categories in Test W-1: Visual Materials. Five are concerned with map reading skills, and three with skills in interpreting graphic and tabular displays of information.

Test W-1: Visual Materials
SKILLS OBJECTIVES **NUMBER OF ITEMS**

MAP READING	Form 7 GRADE LEVEL 3	4	5	6	7	8	Form 8 GRADE LEVEL 3	4	5	6	7	8
1 Locating and Describing Places (LOC)	8	6	8	8	9	8	10	8	11	9	8	6
1A Through the use of standard map symbols	7	5	5	1	2	1	5	5	5	1	•	•
1B Through the use of a key	•	•	1	1	1	1	1	1	3	3	3	1
1C Through the use of distance and/or direction	1	1	2	3	3	2	4	2	3	2	2	1
1D Through the use of latitude or longitude	•	•	•	3	3	4	•	•	•	3	3	4
2 Determining Direction (DIR)	5	4	3	2	2	3	3	2	1	2	2	3
2A From orientation	4	3	2	1	•	•	2	1	•	•	•	•
2B From parallels or meridians	•	•	•	1	1	2	•	•	•	1	1	2
2C Of river flow or slope of land	1	1	1	•	1	1	1	1	1	1	1	1
3 Determining Distance (DIS)	5	5	5	3	2	5	7	6	5	2	2	5
3A On a road or street map	2	2	1	•	•	1	2	2	1	•	•	2
3B By using a scale of distance	•	1	1	2	1	1	1	2	2	1	1	1
3C Comparing distances or areas	3	2	3	1	1	3	4	2	2	1	1	2
4 Interpreting and Relating Data on Population, Transportation, Elevation, Rainfall, Products, Resources, etc. (INT)	•	3	3	7	7	7	•	3	3	7	7	7
5 Inferring Beliefs and Living Conditions (INF)	8	10	10	11	9	10	6	9	9	11	10	12
5A Tracing routes of travel	4	4	3	1	1	2	3	3	3	1	1	2
5B Understanding seasonal variations, sun patterns, and time differences	•	•	•	4	4	5	•	•	•	5	5	6
5C Visualizing landscape features	1	3	3	3	1	1	1	2	2	1	1	1
5D Relating living conditions to location and land features	3	3	4	3	3	2	2	4	4	4	3	3

Suggestions for Developing Map Reading Skills

1. Have a definite planned readiness program. Most children are not prepared to make effective use of maps when they are introduced in geography textbooks. Instruction in map reading should begin in the first grade. Maps of the classroom, of the school building, and of the neighborhood should be introduced first. Whenever a trip is taken, the teacher should diagram the route before leaving the classroom.

(Continued on next page)

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2. Make use of opportunities for pupils to construct their own maps. Problems that arise in connection with map construction are very useful for building map reading skills.
3. Make use of air photos of the community and compare these with maps of large scale, either commercial or teacher-made. This is a very effective means of teaching children to visualize actual landscape features represented by maps.
4. Make frequent use of road maps. These provide excellent opportunities for teaching orientation, location, distance, direction, and use of the map key.
5. Have frequent lessons on using a key to interpret symbols, for example, finding the size of a certain city on a road map, or the elevation of a region on a continent map.
6. Give practice in reading direction from a map, asking questions such as "What direction is Salt Lake City from Denver? . . . from Seattle?" Have pupils locate, by direction from some well-known point, places mentioned in the current news. It is a very good procedure to call to the pupils' attention the value of fixing in one's mind a *few key reference points* rather than trying to fix all.
7. Have pupils trace the courses of rivers from source to mouth to show the direction of river flow. Relate slope of land to direction of river flow.
8. Give practice in using the scale of miles, particularly in tracing irregular routes.
9. Give practice in locating places through the use of parallels and meridians.
10. Constantly emphasize the visualization of landscape features from map details; the fact that here is a mountain that a railroad must tunnel under or go around; that there is a river which must be bridged.
11. Point out in map study how ways of life may be inferred from map details such as altitude, terrain, rainfall, temperature, presence of natural resources, etc.
12. Have a map lesson discussion at the beginning of study of a new region to obtain as many facts as possible about the new region from the map. Raise such questions as, "What crops do you expect the people of the region to raise, when you consider the temperature, rainfall, and length of the growing season?"

[redacted] ITBS ITEM ANALYSIS
FOR SUBTEST - INTERPRETATION OF VISUAL MATERIALS

#	OBJECTIVE DATA DESCRIPTION	DATE FORM CLASS # ST	M 80 8- 3 3 DIST 81	M 80 8- 4 4 DIST 70	M 80 8- 5 5 DIST 68	M 80 8- 6 6 DIST 63	M 80 8- 7 7 DIST 61	M 80 8- 8 8 DIST 56	WEIGHTED TOTAL
5	READS GRAPHS AND TABLES TO DETERMINE AMOUNTS. (6A-6C)	A	3	4	5	5	5	3	4
		B	87	76	60	49	60	69	65
		C	+	0	0	0	0	0	
		D	92	85	69	58	70	69	73
		E	5	9	9	9	10	0	8
6	READS GRAPHS AND TABLES TO COMPARE QUANTITIES. (7A-7C)	A	6	5	7	8	9	7	7
		B	77	68	45	44	50	54	55
		C	+	-	0	0	0	0	
		D	85	71	56	54	59	52	63
		E	8	3	11	10	9	-2	8
7	READS GRAPHS & TABLES TO INTERPRET RELATIONSHIPS AND TRENDS. (8A-8D)	A	1	3	5	5	9	11	5
		B	80	60	57	43	44	47	50
		C	0	0	+	0	0	0	
		D	86	71	73	55	52	50	58
		E	6	11	16	12	8	3	8
	COMPOSITE AVERAGE	A	36	40	46	49	52	54	46
		B	64	61	56	48	51	53	55
		C	+	-	+	0	0	0	
		D	74	65	71	60	64	57	65
		E	10	4	15	12	13	4	10

CODE USED IN CHART = ABOVE

A = NUMBER OF ITEMS B = AVG STATE PERCENT CORRECT
C = THE OBJECTIVE STRENGTH RANKING (WHERE ++ IS HIGH)
D = AVG SCHOOL % E = DIFF. BETWEEN SCHOOL & STATE

Test W-1: Visual Materials

SKILLS OBJECTIVES — **NUMBER OF ITEMS**

READING GRAPHS AND TABLES	Form 7 GRADE LEVEL 3	4	5	6	7	8	Form 8 GRADE LEVEL 3	4	5	6	7	8
6 Reading Amounts (RAM)	4	2	2	1	2	2	3	4	5	5	5	3
6A Using the scales on bar and line graphs	1	1	2	1	2	1	1	1	3	2	2	•
6B Interpreting the sectors of a circle graph	1	1	•	•	•	1	1	1	•	•	•	•
6C Locating a cell in a table	2	•	•	•	•	•	1	2	2	3	3	3
7 Comparing Quantities (COQ)	5	7	8	4	6	6	6	5	7	8	9	7
7A Determining rank	2	4	3	•	•	1	2	1	•	•	•	•
7B Determining differences between amounts	3	2	4	4	5	4	4	3	4	4	4	4
7C Determining ratios	•	1	1	•	1	1	•	1	3	4	5	3
8 Interpreting Relationships and Trends (REL)	1	3	7	13	15	13	1	3	5	5	9	11
8A Interpreting titles and subtitles	•	•	1	1	1	•	•	1	2	1	1	•
8B Determining relative rates and trends	•	2	3	1	1	2	•	•	1	2	4	5
8C Determining underlying relationships	1	•	1	5	7	6	•	2	2	1	2	3
8D Generalizing and drawing conclusions	•	1	2	6	6	5	1	•	•	1	2	3
Totals	36	40	46	49	52	54	36	40	46	49	52	54

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Suggestions for Developing Skills in Reading Graphs and Tables

Graphs and tables are tools for communicating knowledge and require the use of specific skills and abilities. Although some systematic instruction is provided in mathematics textbooks, the application of skills is most often in social studies and science.

1. Making and reading simple graphs and tables should be begun early. The simplest types are those showing individual or class progress on spelling charts, number of books read, etc. Such charts have simple data on two axes: on one the children's names, on the other the scores.
2. Instruction in reading graphs and tables should be conducted whenever problems arising out of regular classroom activities can be solved or better understood by using these tools. A temperature record over a period of several weeks serves as a good introduction to graphs. One graph or table can effectively summarize data (such as cotton production by states, for example) scattered throughout several pages of text.
3. Make frequent use of pictographs, particularly in the lower grades. These are used with increasing frequency in magazines, newspapers, and textbooks. Pictographs are a logical introduction to bar graphs.
4. Reasons for plotting data in large units (millions of bushels, thousands of tons, etc.) can best be explained through the use of class projects in building graphs.
5. Give pupils instructions in making comparisons. At first these should be relative statements involving more, less, and the same. Later, comparisons involving differences (how much more?) and ratio (how many times as much?) should be made.
6. Emphasize constantly the important conclusions one may draw from a graph. Encourage critical thinking in this respect by having pupils state in their own words exactly what the given graph portrays. Conduct discussion by asking such questions as, "What is the one most important fact which this graph shows?"

[redacted] ITBS ITEM ANALYSIS

FOR SUBTEST - USING REFERENCE MATERIALS

#	OBJECTIVE DATA DESCRIPTION	DATE FORM CLASS # ST	M 80 8- 3 3 DIST 81	M 80 8- 4 4 DIST 70	M 80 8- 5 5 DIST 68	M 80 8- 6 6 DIST 63	M 80 8- 7 7 DIST 61	M 80 8- 8 8 DIST 66	WEIGHTED TOTAL
1	ALPHABETIZE SKILLFULLY (A)	A	8	8	9	9	9	9	9
		B	74	81	64	79	85	86	78
		C	+	--	+	+	0	0	
		D	84	81	81	91	88	88	85
		E	10	0	17	12	3	2	7
2	USE A TABLE OF CONTENTS OR AN INDEX (C,I)	A	15	15	15	8	8	8	12
		B	51	70	78	47	55	59	62
		C	0	0	0	-	0	0	
		D	60	79	87	52	65	60	70
		E	9	9	9	5	10	1	8
3	USE A DICTIONARY, ENCYCLOPEDIA,KEY AND GUIDE WORDS. (D1-D6,E,G,K)	A	7	14	14	22	23	23	17
		B	69	49	66	68	58	63	62
		C	0	-	0	0	0	0	
		D	71	54	77	76	68	67	69
		E	2	5	11	8	10	4	7
4	USE GENERAL REFERENCE MATERIALS. (R1-R9)	A	7	7	7	7	7	8	7
		B	68	80	48	64	72	52	64
		C	+	0	+	0	+	++	
		D	79	85	67	75	84	65	76
		E	11	5	19	11	12	13	12
	COMPOSITE AVERAGE	A	37	44	45	46	47	48	44
		B	63	67	67	66	65	65	65
		C	0	-	0	0	0	+	
		D	71	72	80	74	74	69	73
		E	8	5	13	8	9	4	8

CODE USED IN CHART = ABOVE

A = NUMBER OF ITEMS B = AVG STATE PERCENT CORRECT
C = THE OBJECTIVE STRENGTH RANKING (WHERE ++ IS HIGH)
D = AVG SCHOOL % E = DIFF. BETWEEN SCHOOL & STATE

52

50

Reference Materials

Test W-2: Reference Materials
SKILLS OBJECTIVES

NUMBER OF ITEMS

	Form 7						Form 8					
	GRADE LEVEL						GRADE LEVEL					
	3	4	5	6	7	8	3	4	5	6	7	8
A Alphabetizing	8	8	9	9	9	9	8	8	9	9	9	9
C Using a Table of Contents	7	7	7	•	•	•	7	7	7	•	•	•
I Using an Index	8	8	8	8	8	8	8	8	8	8	8	8
D Using a Dictionary	7	9	9	9	9	9	7	9	9	9	9	9
D1 Spelling	2	1	1	1	1	1	2	1	1	1	•	•
D2 Pronunciation	•	2	2	2	1	1	•	2	2	2	2	2
D3 Syllabification	•	1	1	1	1	1	•	1	1	1	1	1
D4 Plural forms	•	•	•	•	1	1	•	•	•	•	1	1
D5 Parts of speech	•	•	•	•	2	2	•	•	•	•	1	1
D6 Meaning	5	5	5	5	3	3	5	5	5	5	4	4
E Using Encyclopedias	•	5	5	5	6	6	•	5	5	5	6	6
G Using Guide Words	•	•	•	4	4	4	•	•	•	4	4	4
K Using Key Words	•	•	•	4	4	4	•	•	•	4	4	4
R Using General Reference Materials	7	7	7	7	7	8	7	7	7	7	7	8
R1 Use of the parts of a book: index, table of contents, etc.	•	•	1	1	1	1	1	1	•	•	•	2
R2 Use of textbooks	•	•	1	1	1	•	•	•	1	1	1	1
R3 Use of dictionary	1	1	1	1	1	1	1	1	1	1	1	•
R4 Use of encyclopedias	1	1	•	•	•	1	•	•	1	1	1	1
R5 Use of calendar	1	1	•	•	•	•	1	1	•	•	•	•
R6 Use of maps, globes, and atlases	1	1	2	2	2	1	1	1	1	1	1	•
R7 Use of current magazines	1	1	1	1	1	•	•	•	1	1	1	•
R8 Use of special references such as *Who's Who in America*, *The World Almanac*, etc.	•	•	•	•	•	2	1	1	1	1	1	3
R9 Book selection	2	2	1	1	1	2	2	2	1	1	1	1
	37	44	45	46	47	48	37	44	45	46	47	48

Suggestions for Developing Ability to Use Reference Materials

The knowledge of the type of reference to use in solving particular problems should be a result of the *regular use of references*. Children should be given practice in these skills only as they are used in doing lessons, making reports, looking up data, and in other real situations. Although practice through use of material similar to that in the test should be given to correct weaknesses, there is no doubt that drill in connection with solving genuine problems is better.

These skills will be used by pupils all the rest of their lives. The effective person knows where to find the answers to questions that arise in daily activities. The habit of going to sources of information to get answers to problems should be established early. The requisite knowledge of sources of information and applied skill in their use should be introduced as pupils have need for them in problem-solving activities.

One of the essential conditions for effective development of these skills is the availability of standard reference works in the room or school library. Dictionaries, encyclopedias, atlases, almanacs, and other standard reference works should be placed where they can be *used*. Specifically planned instructional activities can aid in assuring effective use of reference materials.

A few types of activities which may be helpful in developing the reference skills are listed below.

1. When pupils make reports in class, the teacher may put on the board the titles of any sources, other than their own texts, which the pupils used.
2. Have pupils make lists of all source books available in their own school, such as dictionary, atlas, thesaurus, *American Peoples Encyclopedia*, *Collier's Encyclopedia*, *The World Almanac*, or others.
3. Have different pupils report on the types of material to be found in each source and how it is organized.

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[redacted] ITBS ITEM ANALYSIS
FOR SUBTEST - MATHEMATICS - CONCEPTS

#	OBJECTIVE DATA DESCRIPTION	DATE FORM CLASS # ST	M 80 8- 3 3 DIST 81	M 80 8- 4 4 DIST 70	M 80 8- 5 5 DIST 68	M 80 8- 6 6 DIST 63	M 80 8- 7 7 DIST 61	M 80 8- 8 8 DIST 66	WEIGHTED TOTAL
1	UNDERSTAND CONCEPTS OF NUMERATION,SETS, AND NUMBER SYSTEMS. (N1-N6)	A	8	9	8	7	8	7	8
		B	76	73	71	72	64	55	69
		C	0	0	+	0	0	0	
		D	81	81	85	80	68	58	76
		E	5	8	14	8	4	3	7
2	UNDERSTAND CONCEPTS OF EQUATIONS, INEQUALITIES,NUMBER SENTENCES. (E1 & E2)	A	3	3	5	4	4	4	4
		B	77	69	59	66	53	51	62
		C	0	+	+	0	0	-	
		D	78	83	77	74	64	46	70
		E	1	14	18	8	11	-5	8
3	UNDERSTAND CONCEPTS INVOLVING WHOLE NUMBERS & INTEGERS. (W1-W7)	A	9	9	7	7	5	4	7
		B	64	58	57	62	72	67	62
		C	0	0	+	+	0	0	
		D	68	65	73	79	84	67	72
		E	4	7	16	17	12	0	10
4	UNDERSTAND CONCEPTS CONCERNING FRACTIONS (F1-F7)	A	2	4	7	9	8	8	6
		B	76	56	58	53	50	52	55
		C	0	-	--	0	+	--	
		D	75	62	57	65	69	42	60
		E	-1	6	-1	12	19	-10	5
5	UNDER. DECIMALS, PER CENT,CURRENCY,GEO-METRY, & MEASUREMENT (D1-D6,G1-G6)	A	6	7	10	13	17	21	12
		B	63	43	48	53	57	55	54
		C	0	--	0	-	0	0	
		D	66	43	58	56	67	56	58
		E	3	0	10	3	10	1	4
	COMPOSITE AVERAGE	A	28	32	37	40	42	44	37
		B	69	60	58	59	58	55	60
		C	0	0	0	0	0	0	
		D	73	66	69	68	69	54	66
		E	4	6	11	9	11	-1	6

CODE USED IN CHART = ABOVE

A = NUMBER OF ITEMS B = AVG STATE PERCENT CORRECT
C = THE OBJECTIVE STRENGTH RANKING (WHERE ++ IS HIGH)
D = AVG SCHOOL % E = DIFF. BETWEEN SCHOOL & STATE

Mathematics Concepts

Test M-1: Mathematics Concepts

SKILLS OBJECTIVES — **NUMBER OF ITEMS**

	Form 7 GRADE LEVEL						Form 8 GRADE LEVEL					
	3	4	5	6	7	8	3	4	5	6	7	8
N Numeration, Number Systems, and Sets	10	11	9	9	8	7	8	9	8	7	6	7
N1 Counting and Number Series	1	1	•	•	1	1	3	1	•	•	1	1
N2 Ordinals	1	•	•	•	•	•	1	1	•	•	•	•
N3 Place Value and Expanded Notation	3	3	3	3	2	2	2	3	3	2	3	3
N4 Properties of Number Systems	4	6	4	3	3	2	1	3	4	4	4	3
N5 Subsets of Number Systems	•	1	1	1	1	1	1	1	•	•	•	•
N6 Sets	1	•	1	2	1	1	•	•	1	1	•	•
E Equations, Inequalities, and Number Sentences	3	4	5	4	4	5	3	3	5	4	4	4
E1 Operational and Relational Symbols	2	1	2	1	•	1	3	2	2	1	1	1
E2 Solution of Number Sentences	1	3	3	3	4	4	•	1	3	3	3	3
W Whole Numbers; Integers	7	7	7	6	5	4	9	9	7	7	5	4
W1 Reading and Writing	2	1	•	1	1	•	3	2	1	1	1	•
W2 Relative Values	2	1	•	•	•	1	2	1	•	•	•	•
W3 Terms	•	1	2	2	2	1	1	2	3	3	1	2
W4 Fundamental Operations: Number Facts	2	2	2	1	•	•	2	2	1	•	•	•
W5 Fundamental Operations: Ways to Perform	1	1	1	1	•	•	1	1	•	•	•	•
W6 Fundamental Operations: Estimating Results and Rounding	•	1	2	1	1	1	•	1	2	2	2	1
W7 Negative Numbers	•	•	•	•	1	1	•	•	•	1	1	1
F Fractions	2	4	7	8	8	7	2	4	7	9	8	8
F1 Part of a Whole and Partitioning of a Set	2	2	2	1	•	•	1	1	2	1	•	•
F2 Relative Values	•	1	1	1	2	1	•	1	1	2	2	1
F3 Equivalent Fractions	•	•	1	2	2	2	•	•	1	2	2	1
F4 Terms	•	•	1	2	1	•	•	•	1	1	1	1
F5 Fundamental Operations: Ways to Perform	•	•	1	1	2	3	1	2	2	1	1	3
F6 Fundamental Operations: Estimating Results	•	1	1	•	•	•	•	•	•	1	1	•
F7 Ratio and Proportion	•	•	•	1	1	1	•	•	•	1	1	2
D Decimals, Currency, and Per Cent	2	•	•	5	9	11	2	•	1	6	9	11
D1 Reading and Writing	1	•	•	1	1	2	1	•	•	1	1	1
D2 Relative Values	1	•	•	1	1	•	1	•	•	1	1	1
D3 Fundamental Operations: Ways to Perform	•	•	•	•	1	3	•	•	•	1	1	2
D4 Fundamental Operations: Estimating Results and Rounding	•	•	•	1	2	2	•	•	•	1	2	3
D5 Equivalence: Decimals, Fractions, and Per Cents	•	•	•	1	3	2	•	•	•	1	3	3
D6 Probability and Statistics	•	•	•	1	1	2	•	•	1	1	1	1
G Geometry and Measurement	4	6	9	8	8	10	4	7	9	7	8	10
G1 Measurement: Quantity, Time, and Temperature	2	1	2	1	•	•	1	2	2	•	•	•
G2 Measurement: Length and Weight	•	1	3	3	2	2	1	2	2	1	1	2
G3 Recognizing Types and Parts of Geometric Figures	2	4	2	1	2	3	2	2	3	4	4	2
G4 Area and Perimeter of Plane Figures	•	•	1	2	3	3	•	1	1	1	2	3
G5 Surface Area and Volume of Solid Figures	•	•	•	•	1	1	•	•	•	•	•	1
G6 Use of Geometric Figures in Description and Proof	•	•	1	1	•	1	•	•	1	1	1	2
Totals	28	32	37	40	42	44	28	32	37	40	42	44

Suggestions for Developing Mathematics Concepts

At the present time there is still diversity in method among widely-used programs. In fact, some of the newer programs are more traditional in method than many of the programs which were widely accepted in the late 1960's and early 1970's. However, the *objectives* of the majority of all programs, whether contemporary or traditional, are highly similar.

As in other content areas, the particular method employed is probably less important than the skill of the teacher in using the method. Any time a change in method takes place it will take time for teachers to become proficient in the use of the new methods, to learn what works and what does not, how to distribute emphasis, how to provide for individual differences, etc.

The mathematics teacher should realize that pupils need more time to master a fact or process when meaning and understanding are stressed than when mere "telling" is followed by drills. In the long run, children taught by methods that develop meaning and understanding will achieve superior competence, even though they may seem to be temporarily retarded by insistence upon understanding in the early stages of instruction.

The suggestions below are believed to represent the general philosophy of method endorsed by proponents of most major instructional programs.

1. Strive always to develop understanding of concepts, processes, and relationships. Introduce concepts through problem situations in which pupils are encouraged to discover solutions for themselves rather than to depend on explanations and demonstrations.
2. Encourage pupils to experiment and to explore the possibilities of alternate solutions. Try to develop and reward resourcefulness in verification and proof.
3. Create a climate in which the importance of mathematics is recognized, not only in the solution of immediate problems, but also as a base for the advanced study of all mathematics, science, and other fields as well.

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[redacted] ITBS ITEM ANALYSIS

FOR SUBTEST - MATHEMATICS - PROBLEM SOLVING

#	OBJECTIVE DATA DESCRIPTION	DATE M 80 FORM 8- 3 CLASS 3 DIST # ST 81	M 80 8- 4 4 DIST 70	M 80 8- 5 5 DIST 68	M 80 8- 6 6 DIST 63	M 80 8- 7 7 DIST 61	M 80 8- 8 8 DIST 66	WEIGHTED TOTAL
1	SOLVE SINGLE-STEP: ADDITION & SUBTRACTION. (1C,1W,1F)	13 64 0 70 6	10 67 0 74 7	8 73 + 86 13	4 76 0 85 9	5 52 0 65 13	4 55 0 57 2	8 65 73 8
2	SOLVE SINGLE-STEP PROBLEMS:DIVISION-MULTIPLICATION. (2C,2W,2F)	6 45 0 46 1	7 51 0 60 9	7 55 + 72 17	10 54 0 66 12	8 59 0 67 8	9 48 0 50 2	8 52 60 8
3	SOLVE MULTIPLE-STEP PROBLEMS:COMBINED USE OF OPERATIONS IN CURRENCY. (3C)	1 53 + 63 10	1 74 - 79 5	3 52 0 64 12	9 56 + 72 16	9 60 0 69 9	8 59 0 61 2	5 58 67 9
4	SOLVE MULTIPLE-STEP PROBLEMS: COMBINED OPERATIONS IN PER %,WH#'S,ETC.(3W,3F)	3 54 - 55 1	7 53 - 57 4	9 61 + 75 14	6 73 0 83 10	8 47 0 58 11	11 45 0 45 0	7 54 61 7
	COMPOSITE AVERAGE	23 57 0 62 5	25 59 0 66 7	27 62 + 76 14	29 62 0 74 12	30 55 0 65 10	32 50 0 52 2	27 57 65 8

CODE USED IN CHART = ABOVE

A	B
C	
D	E

A = NUMBER OF ITEMS B = AVG STATE PERCENT CORRECT
C = THE OBJECTIVE STRENGTH RANKING (WHERE ++ IS HIGH)
D = AVG SCHOOL % E = DIFF. BETWEEN SCHOOL & STATE

61

60

Mathematics Problem Solving

Test M-2: Mathematics Problem Solving

SKILLS OBJECTIVES — **NUMBER OF ITEMS**

	Form 7						Form 8					
	GRADE LEVEL						GRADE LEVEL					
	3	4	5	6	7	8	3	4	5	6	7	8
1 Single-Step Problems: Addition - Subtraction	13	13	11	6	3	3	13	10	8	4	5	4
1C Currency	3	3	3	•	•	1	4	4	4	1	1	•
1W Whole Numbers	10	8	6	5	2	1	9	5	2	1	1	1
1F Fractions, Decimals, Per Cents	•	2	2	1	1	1	•	1	2	2	3	3
2 Single-Step Problems: Multiplication - Division	3	4	6	7	4	5	6	7	7	10	8	9
2C Currency	2	1	•	2	3	4	2	3	3	2	3	2
2W Whole Numbers	1	3	5	4	•	•	4	4	3	5	2	•
2F Fractions, Decimals, Per Cents	•	•	1	1	1	1	•	•	1	3	3	7
3 Multiple-Step Problems: Combined Use of Basic Operations	7	8	10	16	23	24	4	8	12	15	17	19
3C Currency	4	5	6	9	10	10	1	1	3	9	9	8
3W Whole Numbers	3	3	4	7	7	6	3	7	9	6	4	4
3F Fractions, Decimals, Per Cents	•	•	•	•	6	8	•	•	•	•	4	7
Totals	23	25	27	29	30	32	23	25	27	29	30	32

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Suggestions for Developing Problem-Solving Skills

In addition to regularly providing problems for pupils to solve, the teacher may find it helpful to keep the following suggestions in mind when working on the development of problem-solving skills.

1. Encourage pupils to solve problems in a variety of ways.

2. Emphasize what needs to be done to solve a problem and why it needs to be done.

3. At times let pupils work on sets of verbal problems in small groups. There is some research evidence that group agreement on how to proceed results in better achievement than being told how to solve a problem.

4. Present problems orally to foster habits of attention, to give pupils practice in discriminating quickly between pertinent and extraneous information, and to provide practice in deciding quickly on a problem-solving strategy.

5. Have the pupils write mathematical sentences that can be used in solving specific problems. That is, teach them to translate verbal phrases and sentences into mathematical language.

6. Encourage pupils to ask questions of themselves: "What facts are given?" "What do I want to find out?" "What information is needed?" Often problems offer irrelevant information, and it becomes necessary to select the pertinent facts or conditions.

7. Provide many and varied situations that give students opportunities for structuring and analyzing situations that really constitute a *problem* and not just a computational exercise.

8. Have pupils test the reasonableness of their answers. Estimation is a crucial element in problem solving.

9. Provide as many opportunities for problem solving as time allows. Research evidence indicates that the most important condition for becoming a good problem-solver is practice.

[redacted] ITBS ITEM ANALYSIS

FOR SUBTEST - MATHEMATICS - COMPUTATION

#	OBJECTIVE DATA DESCRIPTION	DATE FORM CLASS # ST	M 80 8- 3 3 DIST 81	M 80 8- 4 4 DIST 70	M 80 8- 5 5 DIST 68	M 80 8- 6 6 DIST 63	M 80 8- 7 7 DIST 61	M 80 8- 8 8 DIST 66	WEIGHTED TOTAL
1	COMPUTE CORRECTLY USING WHOLE NUMBER ADDITION. (WA)	A	16	13	10	5	3	3	9
		B	71	74	81	83	78	72	75
		C	0	0	0	0	0	0	
		D	77	84	91	91	87	75	83
		E	6	10	10	8	9	3	8
2	COMPUTE CORRECTLY USING WHOLE NUMBER SUBTRACTION. (WS)	A	16	13	9	5	3	3	9
		B	66	66	73	71	63	65	67
		C	0	0	++	0	+	+	
		D	71	78	89	81	79	74	78
		E	5	12	16	10	16	9	11
3	COMPUTE CORRECTLY USING WHOLE NUMBER MULTIPLICATION & DIVISION. (WM,WD)	A	7	16	19	18	10	5	12
		B	48	55	63	72	67	69	62
		C	-	+	++	0	+	0	
		D	44	72	85	81	83	72	75
		E	-4	17	22	9	16	3	13
4	COMPUTE CORRECTLY USING FRACTIONS. (FA,FS,FM,FD)	A	0	0	7	13	18	16	8
		B	0	0	34	46	51	49	47
		C			--	++	++	--	
		D	0	0	36	75	77	39	59
		E	0	0	2	29	26	-10	12
5	COMPUTE CORRECTLY USING DECIMALS. (DA,DS,DM,DD)	A	0	0	0	4	11	18	5
		B	0	0	0	42	41	51	47
		C				0	0	0	
		D	0	0	0	52	52	51	52
		E	0	0	0	10	11	0	5
	COMPOSITE AVERAGE	A	39	42	45	45	45	45	43
		B	64	64	65	63	55	54	61
		C	0	0	+	+	++	0	
		D	69	78	79	78	73	52	71
		E	5	14	14	15	18	-2	10

CODE USED IN CHART ABOVE

A = NUMBER OF ITEMS B = AVG STATE PERCENT CORRECT

C = THE OBJECTIVE STRENGTH RANKING (WHERE ++ IS HIGH)

D = AVG SCHOOL % E = DIFF. BETWEEN SCHOOL & STATE

64

65

Mathematics Computation

Test M-3: Mathematics Computation

SKILLS OBJECTIVES — **NUMBER OF ITEMS**

	Form 7						Form 8					
	GRADE LEVEL						GRADE LEVEL					
	3	4	5	6	7	8	3	4	5	6	7	8
W Whole Number	39	42	38	28	16	11	39	42	38	28	16	11
WA Addition	16	13	10	5	3	3	16	13	10	5	3	3
WS Subtraction	16	13	9	5	3	3	16	13	9	5	3	3
WM Multiplication	7	12	12	9	5	3	7	12	12	9	5	3
WD Division	•	4	7	9	5	2	•	4	7	9	5	2
F Fractions	•	•	7	13	18	15	•	•	7	13	18	16
FA Addition	•	•	3	4	5	3	•	•	3	5	5	3
FS Subtraction	•	•	4	6	6	3	•	•	4	5	6	3
FM Multiplication	•	•	•	3	4	5	•	•	•	3	4	5
FD Division	•	•	•	•	3	4	•	•	•	•	3	5
D Decimals	•	•	•	4	11	19	•	•	•	4	11	18
DA Addition	•	•	•	2	3	4	•	•	•	2	3	4
DS Subtraction	•	•	•	2	3	4	•	•	•	2	3	4
DM Multiplication	•	•	•	•	3	5	•	•	•	•	3	5
DD Division	•	•	•	•	2	6	•	•	•	•	2	5
Totals	39	42	45	45	45	45	39	42	45	45	45	45

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Suggestions for Improving Computation Skills

The ultimate purposes of mathematics instruction in school are the development of problem-solving ability and the understanding of the mathematical concepts a person needs to function in our society. However, developing these skills requires at least a minimal level of competence with computation skills. The teacher may find it helpful to keep the following suggestions in mind when helping pupils to master computational skills.

1. Provide adequate opportunities for practice after understanding has been acquired. Drill should take place under conditions that lead to effective learning. Reliance on drill-and-practice *alone* is usually not an effective approach.
2. Drill should be systematic and distributed over long periods of time. A few minutes of practice every day can help pupils more than an occasional massive "dose." Repetitions over a period of time are essential to maintain competence.
3. Plan for careful initial development of new computation processes; this can reduce the need for drill at later stages.
4. Computation should continually be related to concepts. The rationale behind all computation algorithms is based on our numeration system.
5. Make frequent use of "oral" or "mental" arithmetic. This affords practice in the rapid and efficient manipulation of quantitative concepts.
6. Place considerable emphasis upon estimation and upon judging whether an answer to a particular computation exercise is reasonable.

WORKSHEET FOR CONDENSED OBJECTIVES TESTED BY ITBS

Objective Code	Subject/ Objective	Grade: / Date:					
		# Items	Code (+-)	# Items	Code (+-)	# Items	Code (+-)
	VOCABULARY TARGETS						
	(2) READING (Pages 5,7)						
RD 1	Understands Factual Details re People, Place Objects & Events						
RD 2	Understands Classifications & Deduces Meanings from Context						
RD 3	Understands Functional Relationships, Time & Sequence						
RD 4	Infers Cause & Effect and Draws Conclusions						
RD 5	Infers Traits, Feelings & Motives						
RD 6	Develops Generalizations Concerning Main Idea & Organization						
RD 7	Develops Generalizations, re Applications, Purpose, Language, Viewpoint, Mood & Style						
	(3) SPELLING (Page 9)						
SP 1	Words With Consonant Substitutions Not Detected						
SP 2	Words With Consonant Reversal or Omission Not Detected						
SP 3	Words With Unnecessary or Double Consonants Not Detected						
SP 4	Words With Vowel Substitutions Not Detected						
SP 5	Words With Vowel Reversals, Omissions & Additions Not Detected						
SP 6	Word Sets Which Are Free of Errors Not Detected						
	(4) CAPITALIZATION (Page 11)						
CP 1	Capitalizes Names and Titles						
CP 2	Capitalizes Dates and Holidays						
CP 3	Capitalizes Place Names						
CP 4	Capitalizes Groups & Organizations						
CP 5	Follows Linguistic Conventions						
CP 6	Recognizes Overcapitalization & Error Free Lines						
	(5) PUNCTUATION (Page 13)						
PN 1	Recognizes the Need for Terminal Punctuation						
PN 2	Recognizes the Need for Commas						
PN 3	Recognizes the Need for :; and "" Marks						
PN 4	Recognizes Passages Either Overly or Correctly Punctuated						

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Objective Code	Subject/ Objective	# Items	Code (+-)	# Items	Code (+-)	# Items	Code (+-)
	(6) LANGUAGE USAGE (Page 15)						
US 1	Recognizes Incorrect Verb Usage						
US 2	Recognizes Incorrect Pronoun Usage						
US 3	Recognizes Incorrect Modifier Usage						
US 4	Recognizes Words used Incorrectly Within Context						
US 5	Recognizes Passages Illustrating Correct English Usage						
	(7) VISUAL MATERIALS (Pages 17,19)						
VM 1	Locates & Describes Places Using Maps						
VM 2	Determines Direction Using Maps						
VM 3	Determines Distance Using Maps						
VM 4	Interprets Data and Infers Behavior & Living Conditions Using Maps						
VM 5	Reads Graphs and Tables to Determine Amounts						
VM 6	Reads Graphs and Tables to Compare Quantities						
VM 7	Reads Graphs and Tables to Interpret Relationships and Trends						
	(8) REFERENCE SKILLS (Page 21)						
RF 1	Alphabetizes Skillfully						
RF 2	Uses a Table of Contents or an Index						
RF 3	Uses a Dictionary, Encylopedia, Key and Guide Words						
RF 4	Uses General Reference Materials						
	(9) MATH CONCEPTS (Page 23)						
MC 1	Understands Concepts of Numeration, Sets, & Number Systems						
MC 2	Understands Concepts of Equations, Inequalities, Number Sentences						
MC 3	Understands Concepts Involving Whole Numbers and Integers						
MC 4	Understands Concepts Concerning Fractions						
MC 5	Understands Decimals, Percent, Currency, Geometry & Measurement						
	(10) PROBLEM SOLVING (Page 25)						
MP 1	Solves Single-Step: Addition & Subtraction						
MP 2	Solves Single-Step Problems: Division--Multiplication						
MP 3	Solve Multiple-Step Problems: Combined Use of Operations in Currency						
MP 4	Solves Multiple-Step Problems: Combined Operations in %						
	(11) MATH COMPUTATION (Page 27)						
CO 1	Computes Correctly Using Whole Number Addition						
CO 2	Computes Correctly Using Whole Number Subtraction						
CO 3	Computes Correctly Using Whole Number Multiplication and Division						
CO 4	Computes Correctly Using Fractions						
CO 5	Computes Correctly Using Decimals						